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Passalora sicerariae sp. nov. on *Lagenaria siceraria* from India

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Abstract—A new species, *Passalora sicerariae*, occurring on *Lagenaria siceraria* (bottle gourd) collected in Madhya Pradesh, India, is illustrated and described. It is characterized by ovoid, cyclindrical-obclavate, obclavate, broadly navicular to sub-reniform, pale brown conidia. The new hyphomycete is compared with four other *Passalora* species that occur on *Cucurbitaceae*.

Key words—Bundelkhand region, cercosporoid fungi, *Mycosphaerellaceae,* taxonomy

Introduction

Since Fries (1849) established the genus *Passalora*, about 750 *Passalora* species have been reported. These cercosporoids are common on a wide range of both angiosperms and gymnosperms including horticultural and vegetable crops. New species, new records, and additions to the distribution of cercosporoid fungi have been provided by Chupp (1954), Deighton (1976), Ellis (1976), Crous (1998), Crous & Braun (2003), Braun & Crous (2006), Kamal (2010), and Singh & al. (2008, 2011, 2013). *Passalora* species can cause serious foliar infection resulting in death of leaves. The genus is characterized by the presence of well-developed stromata, sporodochial conidiomata, macronematous conidiophores, and septate conidia that are

pigmented and smooth to finely verruculose with a darkened, thickened, refractive scar (Fries1849, Crous & Braun 2003).

In recent surveys for foliicolous pathogens, many collections of *Passalora* were made in India. One January 2018 survey explored the microfungal diversity in the natural forest of Orchha situated in the northeastern Bundelkhand region of India at elevations of 210–314 m asl. in primarily deciduous forests with an annual rainfall ≤1000 mm. Among the specimens collected was an undescribed *Passalora* species, which we describe and illustrate here.

Materials & methods

Collected specimens were taken to the laboratory in separate paper bags. Free-hand cut sections were taken through infection spots and mounted in lactic acid and cotton blue on glass slides and examined using microscopes. A trinocular Weswox SMZ-33589 microscope (aided with Digi-CAM) was used to study features of the fungus on substrates. Drawings of various morphological structures were done with the help of a camera lucida and measured with a micrometer. The holotype specimen was deposited in Ajrekar Mycological Herbarium, MAC'S Agharkar Research Institute, Pune, India (AMH) and isotype specimen was deposited in Anu Singh Mycological Herbarium, Bipin Bihari P.G. College, Jhansi, Uttar Pradesh, India, (ASMH).

Taxonomy

Passalora sicerariae Anu Singh, Bhartiya & P.N. Singh, **sp. nov.** Fig. 1

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Differs from all other *Passalora* spp. on *Cucurbitaceae* (*P. cayaponiae, P. cucurbiticola, P. guraniae,* and *P. momordicae*) by its longer conidiophores, smaller conidia, and higher number of conidial septa.

Type: India, Uttar Pradesh, Jhansi, Orchha Forest, on living leaves of *Lagenaria siceraria* (Molina) Standl. (*Cucurbitaceae*), 10 Jan 2018, coll. Anu Singh (**Holotype**, AMH 10152; **isotype**, ASMH 108).

Etymology: Specific epithet refers to the host species.

Infection spots amphigenous, circular to subcircular and spreading on entire leaf surface, light brown, 1–8 mm diam. Colonies amphigenous, effuse, punctiform, light brown to greenish. Mycelium internal, unbranched, septate, smooth-walled, hyaline. Stromata well-developed, immersed in the substratum, light brown, 24–75 µm diam. Conidiophores macronematous, mononematous,1–9-fasciculate, erect to procumbent, straight to flexuous, geniculate, smooth, thin-walled, unbranched, 0–7-septate, olivaceous brown, 22–122 × 2–4 µm. Conidiogenous cells integrated, terminal to intercalary

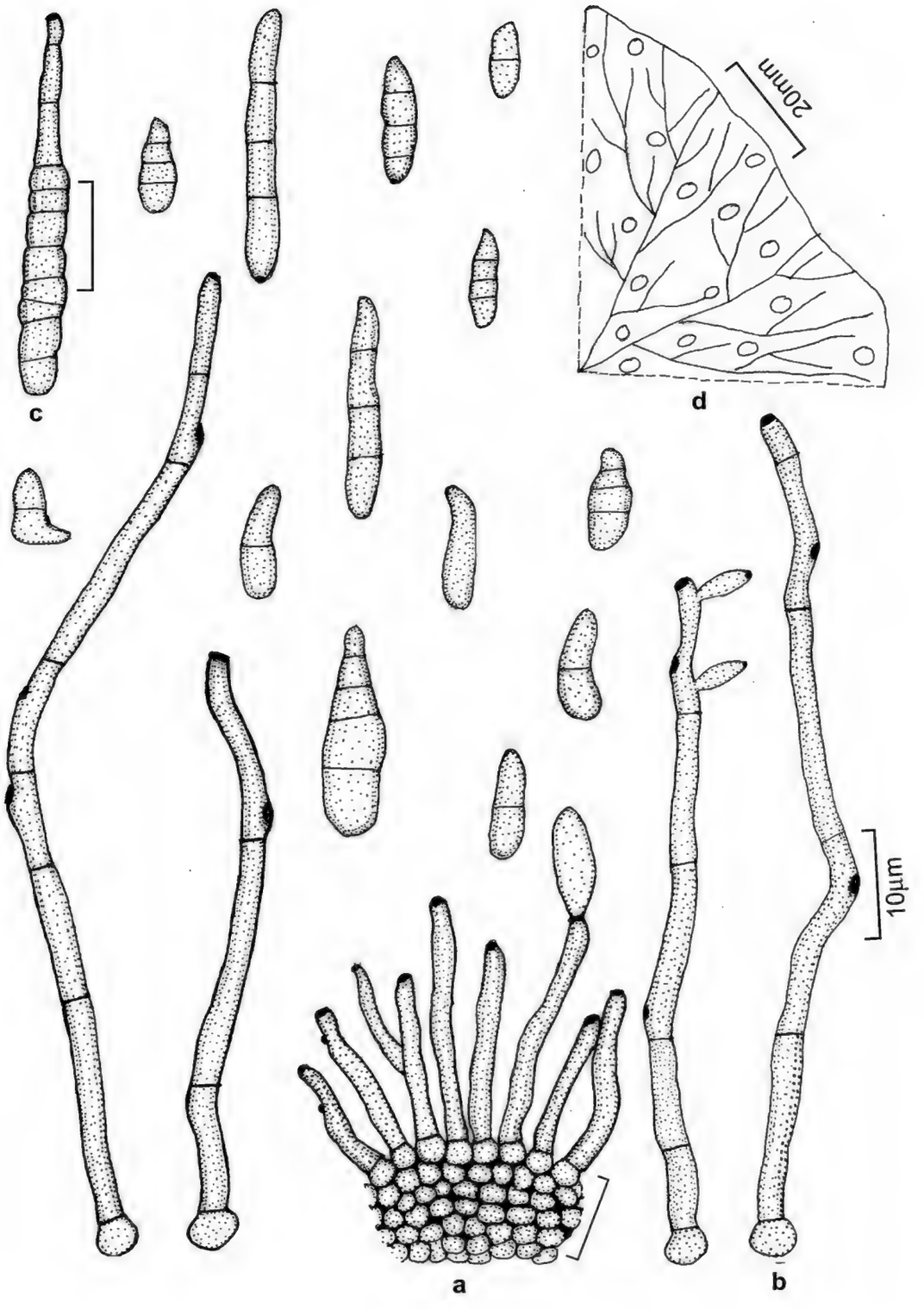

Fig. 1. *Passalora sicerariae* (holotype, AMH 10152).
a. Stroma; b. Conidiophores and conidiogenous cells; c. Conidia; d. Leaf spots.
Scale bars: a–c = 10 µm; d = 20 mm.

or lateral, sympodial, smooth-walled, ellipsoidal. Conidia solitary, acrogenous ovoid, cyclindrical-obclavate, obclavate, broadly navicular to slightly curved, base obconico-truncate, 1–10-septate, 8–46 × 3–4 µm, dry, smooth-walled, pale brown, hilum somewhat thickened.

Discussion

Passalora sicerariae has been databased in Facesoffungi as FoF07931.

Although the fungal databases of Farr & Rossman (2021) do not cite any *Passalora* species on the host genus *Lagenaria,* they do report four *Passalora* species on other genera of *Cucurbitaceae: P. cucurbiticola* (Henn.) U. Braun & Crous, *P. momordicae* (Heald & F.A. Wolf) U. Braun & Crous, *P. cayaponiae* (F. Stevens & Solheim) U. Braun & Crous, and *P. guraniae* R. Kirschner.

Morphological comparison of our collection with these species (Table 1) supports taxonomic separation between *P. sicerariae* and the four closely related taxa. *Passalora sicerariae* conidiophores are longer and narrower compared to *P. cucurbiticola, P. cayaponiae, P. momordicae P. guraniae*, while

Table 1. Comparison of morphological features of *Passalora* species known on *Cucurbitaceae.*

Species	Stromata	Conidiophores	Conidia
*P. cayaponia*e	Rare; non-fasciculate or if massed, resembling pseudo-fascicles	Irregular in width, multiseptate, branched, procumbent, spore scar on rounded tip, pale olivaceous brown, 45–100 × 4–6 µm	Obclavate-cylindric, rounded to long obconic-truncate base, obtusely rounded tip, subhyaline to pale yellowish brown, 25–110 × 4–6 µm
*P. momordic*ae	Substomatal, olivaceous brown 10–30 µm diam.	Erect, usually divergent, septate, geniculate, occasionally branched, flexuous, scars thickened, olivaceous brown, 10–50 × 3–5 µm	Catenate, occasionally in branched chains, subcylindric, 0–7-septate, end obtuse to subtruncate, pale olivaceous, 20–80 × 3–5 µm
*P. gurani*ae	Absent	From superficial mycelium, irregularly branched, often forming fascicles by intertwining & anastomosing, pale brown, almost smooth, ≤100 µm long	In branched chains, cylindrical or obclavate-cylindrical; straight or slightly curved, distinctly verruculose, 0–4-septate, with thicker darkened scars at the base pale to medium brown, 21–51 × 3.5–5.5 µm,
P. sicerarae	Well-developed, dark brown 24–75 µm diam.	1–9-fasciculate, smooth, straight to flexuous geniculate, unbranched thin-walled, reduced to conidiogenous cells, olivaceous brown, 22–122 × 2–4 µm	Cylindrical-obclavate, broadly navicular or sub-reniform, base rounded, obconico-truncate, hila thickened, 1–10-septate, pale brown, 8–46 × 3–4 µm

only *P. cucurbiticola* and *P. sicerariae* possess fasciculate conidiophores. Additionally, conidia in *P. sicerariae* are shorter and the number of conidial septa is greater than found in the other four species. Based on these significant morphological differences, we propose *P. sicerariae* as a new species.

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